

SAMPLING AND MAGNETOMETER SURVEY FINDINGS

JIM'S LIQUID WASTE SITE

STATE ROUTE 706, CULPEPER, CULPEPER COUNTY, VIRGINIA

AUGUST 21, 1992



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Sampling and Magnetometer Survey Findings
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August 21, 1992

A. BACKGROUND

The Jim's Liquid Waste Site (Site) is located approximately three miles west of Culpeper, Culpeper County, Virginia, on State Route 706. The property owner, Mr. Charles Meyers, lives on the site, and approximately 23 people live within a quarter mile radius of the Site. The Site occupies approximately 65 to 70 acres.

According to a Virginia Department of Waste Management (VADWM) preliminary assessment, the Site was used from 1974 to 1982 for the disposal of waste solvents, domestic sewage, and restaurant grease. Wastes accepted at the facility were reported to include organic solvents, epoxy resins, paints, thinners, phenols, coal tars, vinyl ester amine epoxy, asbestos, and chromium wastes. Disposal methods included the burial of drums containing wastes, dumping of liquids and sludge into lagoons and trenches, and incineration of solvents.

In 1979, the Virginia Department of Health (VADOH) directed the facility to discontinue acceptance of industrial waste. In 1981, the owner of the facility was advised to remove the numerous drums present both on the surface and buried in various locations.

In October 1986, VADWM received a report from an anonymous former employee that buried drums remained on the Site. VADWM requested assistance from the U.S. Environmental Protection Agency (EPA) Region III Emergency Response Section (EPA/ERS) to conduct further assessment activities in February 1987.

In February and March 1987, a joint preliminary assessment was conducted by EPA/ERS, VADWM, and the EPA Technical Assistance Team (TAT). Surface drums containing gray residues and organic solvents were sampled, an inventory of all surface drums was made, the on-site residential well (Meyers) was sampled, and a magnetometer survey was conducted over areas reported to contain buried drums. The magnetometer survey indicated that buried metal was present in several areas on the property, and the distribution and magnetic signature of the buried metal was consistent with that encountered with buried drums. The magnetometer survey indicated that approximately 250 to 400 drums were buried in two locations on the Site, at depths ranging from two to five feet.

In April 1987, TAT sampled two on-site monitoring wells. The sample analysis indicated that both monitoring wells contained trace amounts of base-neutral and acid extractible compounds. However, these monitoring wells were not secured and their integrity was questionable.

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A. BACKGROUND (continued)

In June 1987, TAT performed a soil gas survey at the Site in the areas targeted by the magnetometer survey. Field reconnaissance and the soil gas survey identified a partially buried drum exposed at the surface and many drums buried at depths up to 3 feet. The drum found partially buried was in poor condition, and photo-ionization detector (HNU) readings up to 300 units above background were detected from a hole in the drum. HNU readings up to 400 units above background were detected in the soils at the drum burial areas, which suggested that the buried drums were leaking. Field screening with Draeger tubes indicated the presence of xylene and toluene.

In July 1987, EPA/ERS, VADWM and TAT performed additional assessment activities at the Site, including sampling of liquid in partially buried and surface drums, of soils above totally buried drums, and of waters and sediments in the nearby unnamed creek.

In June 1988, the Virginia Electric Power Company (VEPCO), one of the several Potentially Responsible Parties (PRPs), commissioned GSX Services, Inc., of Reidsville, North Carolina, to investigate and determine the location of the buried drums on the property. VEPCO agreed to excavate, remove and properly dispose of the drums of waste as well as a limited amount of visibly contaminated soils at the Jim's Liquid Waste Site. At the end of this operation, VEPCO removed 358 drums and 15 truckloads of contaminated soils. VEPCO had scheduled to do additional investigative work at the Site, but access problems developed with the current Site landowner.

In January 1991, EPA On-Scene Coordinator (OSC) Terry Stilman tasked TAT to perform a sampling and magnetometer survey assessment at the Site. TAT performed both on-site and off-site sampling on April 1 and 2, 1991, according to a pre-approved sampling plan. During the week of May 5, 1991, TAT conducted a magnetometer survey to investigate three areas of concern on the site where previous excavation had occurred and where a nearby resident suspected drums had been buried.

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1991 MULTIMEDIA SAMPLING

TAT collected water samples from the on-site residential well, one on-site monitoring well, two stream locations and a swampy borrow area. Sediment samples were collected from the two stream locations and the swampy borrow area. All samples were analyzed according to Contract Laboratory Program (CLP) Scopes of Work (SOWs) for priority pollutants.

The number and location of the samples are as follows:

HW-8	Water sample from the on-site home-well, unfiltered.
HW-8/FL	Water sample from the on-site home-well, filtered.
MW-1	Water sample from on-site monitoring well, unfiltered.
MW-1/FL	Water sample from on-site monitoring well, filtered.
AQ-1	Water sample from the creek along the south border of the property.
AQ-2	Water sample from the swampy borrow area.
AQ-3	Water sample from the stream along the west border of the property.
AQ-4	Duplicate water sample at location AQ-1.
SED-1	Sediment sample at location AQ-1.
SED-2	Sediment sample at location AQ-2.
SED-3	Sediment sample at location AQ-3.

A map attached in Appendix A shows the sample locations.

The analytical findings are summarized in three tables:

- a) Inorganic Analysis Summary
- b) Volatile Organics Analysis (VOA) Summary
- c) Base-Neutral and Acid Extractibles (BNAs) Analysis Summary

These tables are included in Appendix B.

Metal results of the filtered home-well sample are below the EPA Drinking Water Action Levels.

None of the samples had elevated levels of VOAs or BNAs.

The water sample from the creek on the south border (AQ-1) did not show any elevated levels of contamination, but the duplicate sample (AQ-4) showed 18.4 ppb of antimony.

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1991 MULTIMEDIA SAMPLING (continued)

The sediment sample SED-1 showed 45 milligrams per kilogram (ppm) of antimony, 12.3 ppm of arsenic and 23 ppm of lead; sample SED-2 showed 9 ppm of antimony, 6.2 ppm of arsenic and 16.9 ppm of lead; sample SED-3 showed 10 ppm of antimony, 7.1 ppm of arsenic and 190 ppm of lead. None of these levels are a concern for human health.

All analytical data have been reviewed by the CLP Laboratory according to the CLP Protocol.

1991 MAGNETOMETER SURVEY

TAT performed a magnetometer survey on three large sections of the Site. These areas were considered of concern because they encompassed former PRP drum removal areas or because drums were said to have been historically buried in them.

As a part of the assessment, TAT surveyed the property and established a base grid map of the entire site in 100-foot increments. TAT later re-gridded the base map around the areas of concern and shortened the increments to 25 feet in order to perform an effective magnetometer survey. A total of approximately 500,000 square feet of land were surveyed to set the 100-foot grid. Within the total area surveyed, 80,000 square feet, comprising areas of concern within the site, were surveyed to set the 25-foot grid and were screened using the EG&G Geometrics Proton Precession Magnetometer, Model G-856. The areas of concern were broken into three zones (I, II, III).

The results from the magnetometer survey were tabulated in a data file in XYZ format. X and Y are the grid coordinates and Z is the magnetometer reading. Contour maps of the magnetic values were generated using a computer program (Surfer). The individual contour maps of all three areas are attached as Appendix C. The base grid map of the site in Appendix A shows the location of the three areas of concern.

The anomalies shown in the zone I contour map are due to the presence of overhead power lines. Other areas in zone I do not show any anomalies.

No anomalies were detected in zone II.

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1991 MAGNETOMETER SURVEY (continued)

In zone III, some anomalies were detected in two locations:

981 feet North and 575 feet East.
981 feet North and 695 feet East.

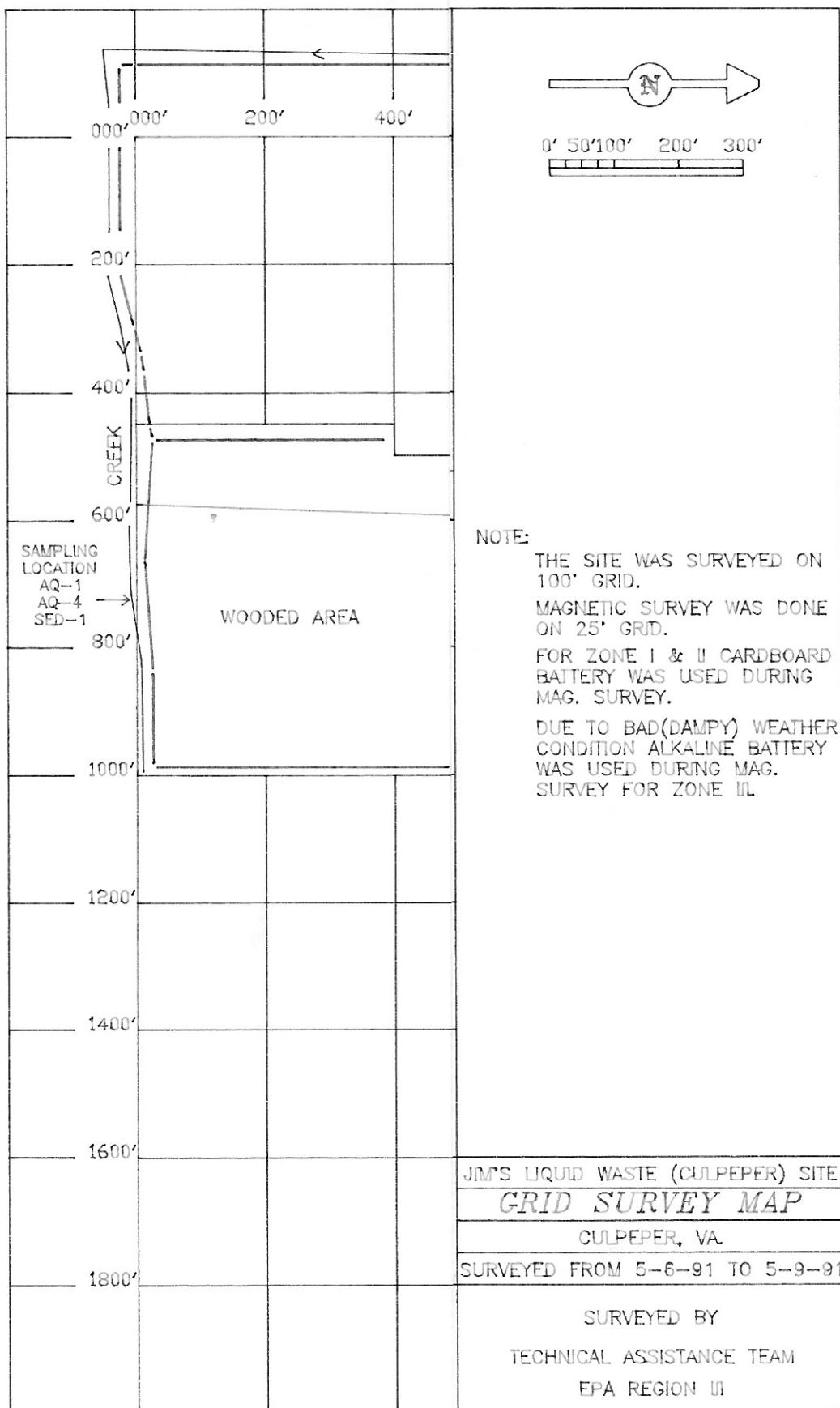
These locations can be identified in the contour map with concentric circles. Also, these two locations are identified on the grid map in Appendix A. These two areas are suspected to have buried drums. Interference from the aboveground utility line is also significant in this zone.

During the screening of zone III, due to rain, cold and damp weather, alkaline batteries were substituted in the magnetometer for the preferred zinc-carbon batteries. This battery change may have caused some inconsistency in magnetometer readings between zone III and zones I and II.

Appendices:

- A. Grid Map/Sample Location Map
- B. Analytical Data Summaries
- C. Magnetometer Contour Survey Maps

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Sampling and Magnetometer Survey Findings Appendix B

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DATA SUMMARY FOR INORGANIC ANALYSIS

Sampled By: Region III TAT on April 1-2, 1991

ANALYTES	HW-8 ppb	HW-8/F ppb	MW-1 ppb	MW-1/F ppb	AQ-1 ppb	AQ-2 ppb	AQ-3 ppb	AQ-4 ppb	SED-1 ppm	SED-2 ppm	SED-3 ppm
Aluminum	[89.7]B	[41.7]B	[131]	[87.1]B	514	2720	737	697	16200	29200	16600
Antimony			[15.6]					[18.4]	[45]L	[9]L	[10]L
Arsenic	[2.1]		16.9	17.4					12.3L	6.2L	7.1L
Barium	[29.8]	[31.5]	[42.8]	[44.4]	[35.4]	[61.9]	[26.5]	[37.6]	132	146	123
Beryllium									[1.5]	[1.1]	[1.1]
Calcium	90900	91600	103000	98900	13200	22600	5900	13700	[1670]	1850	3190
Chromium									36.1	37.9	35.4
Cobalt									[16.3]	18	[19.3]
Copper	[70]B	[5.4]B		[5.6]B		[10.7]B		[3]B	18.6	9.9	13.7
Iron	[97.5]	[29.7]B	[78]	[77.1]B	922	2400	860	1010	36800	39900	34700
Lead	5.5B	4.2B	87	13B		4.4B	3.2B	[2.7]B	23K	16.9K	190K
Magnesium	20300	20500	13000	12600	6320	13700	[4660]	6590	2500	2880	3140
Manganese	38.6	[5.4]B	21.8	[14.1]	43	72.5	55.2	44.7	455K	702K	946K
Nickel					[6.4]				[11.6]	11.5	[13.9]
Potassium	7990	8100	10800	11000	[2570]	[2330]	[1260]	[2660]	[809]	[761]	[834]
Sodium	18000	18200	15000	15200	5290	16700	[4300]	5500	[91]	[156]	[112]
Vanadium						[6.4]			88.9	89.6	92.4
Zinc	[12.8]	[12]B	[18.4]	[11.1]B	[8.2]	21.6			48.6	40.3	103

B = Not detected substantially above the level reported in laboratory or field blanks.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased high. Actual value is expected to be higher.

[] = Analyte present. As values approach the IDL the quantitation may not be accurate.

Sampling and Magnetometer Survey Findings Appendix B

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DATA SUMMARY FOR VOLATILES ANALYSIS

Sampled By: Region III TAT on April 1-2, 1991

ANALYTES	HW-8 ppb	HW-8/F ppb	MW-1 ppb	MW-1/F ppb	AQ-1 ppb	AQ-2 ppb	AQ-3 ppb	AQ-4 ppb	SED-1 ppb	SED-2 ppb	SED-3 ppb
Methylene Chloride									9B	13B	14B
1,2-Dichloroethene			10								
1,2-Dichloroethane							5J				
Trichloroethene			1J								
Tetrachloroethene	5										

DATA SUMMARY FOR BNAs ANALYSIS

Sampled By: Region III TAT on April 1-2, 1991

ANALYTES	HW-8 ppb	HW-8/F ppb	MW-1 ppb	MW-1/F ppb	AQ-1 ppb	AQ-2 ppb	AQ-3 ppb	AQ-4 ppb	SED-1 ppb	SED-2 ppb	SED-3 ppb
Phenol									210J		
Benzoic Acid									390J	290J	
Di-n-butylphthalate								2B	220B	120B	200B
Butylbenzylphthalate											220J
bis(2-Ethylhexyl)phthalate								5B	630B	300B	440B

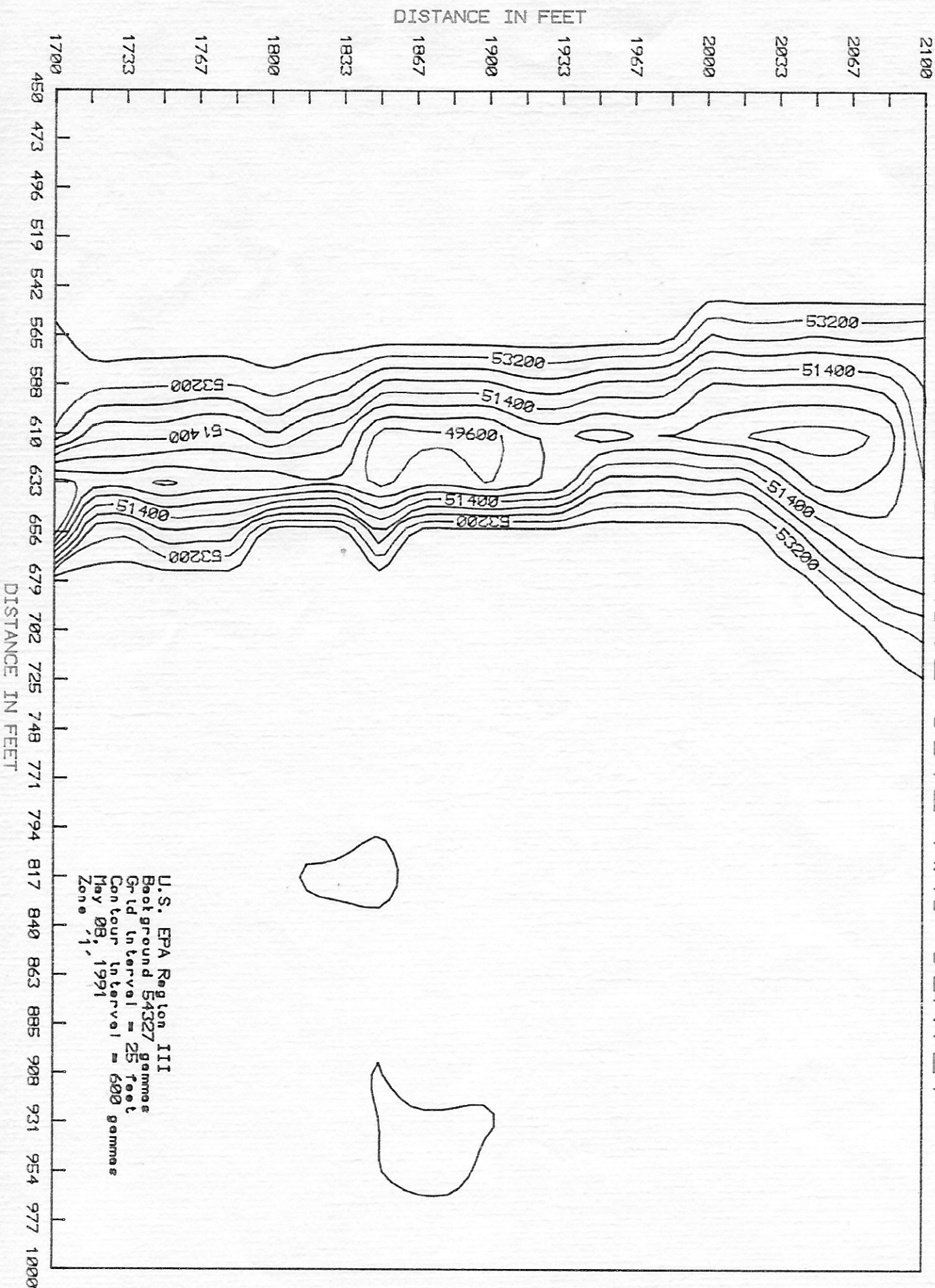
B = Not detected substantially above the level reported in laboratory or field blanks.

J = Analyte present. Reported value may not be accurate or precise.

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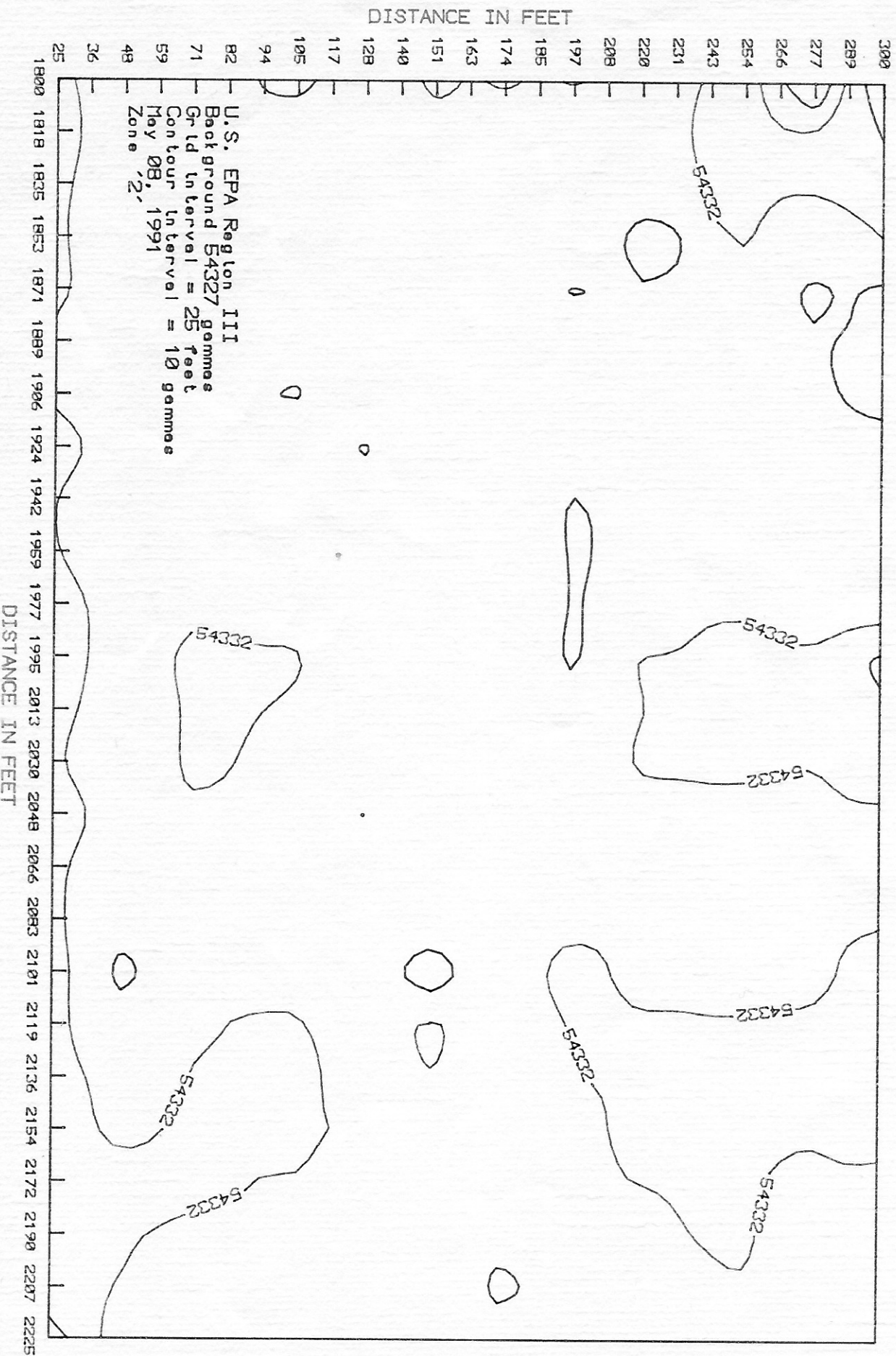
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